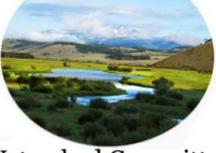


# Big Hole



Watershed Committee

## Big Hole Watershed Committee

Monthly Meeting Minutes

November 20, 2013 - 6pm

Wise River Community Building

### In Attendance

Jen Downing, BHWC; Ginette Abdo, MBMG; Todd Myse, MBMG; Natalie Morrow, TetraTech; Tom Fay, Resident; Liz Jones, Rancher; Jim Carpita, Beaverhead County; Rick Hartz, Beaverhead County; Pete Kamperschroer, Rancher; Craig Fellin, Outfitter; Lee Kirkpatrick, Rancher; Randy Smith, Rancher/Chairman; Jim Hagenbarth, rancher; Doug Finnicum, BSB Water; Jim Olsen, MFWP; Mike Bias, Big Hole River Foundation; Hans Humbert, Rancher; Erik Kalsta, Rancher; Doug Clark, ADLC; Joe Willauer; Guide; Mark Kambich, Rancher; Phil Ralston, Rancher

### Introduction & Snowpack Report

*Attendees introduced themselves.*

*Big Hole streamflow report provided by Mike Roberts, DNRC (see attached)*

### Reports

*Directors Report, Jen Downing*

- All contracts and projects closed out as of October 2013

- BHWC Fall 2013 Newsletter complete and out soon

- California Creek restoration money secured. Work slated for 2014-2015. We are waiting for a final contract. Total funding is \$126,400. Approx \$25,000 of that will apply to BHWC staff for outreach and management.

- 2013 BHWC Annual Appeal: BHWC is continuing to work towards an increase in unrestricted dollars in the organization (that is, money that is not tied to specific tasks or projects). In 2011, donations accounted for 4% of our total budget. We increased donations in 2012 to 12% of our total budget - triple! In 2013, donations already account for 12% of our budget even before the annual appeal has begun. This is a positive, promising, and needed trend. We need to continue increasing this number until near 1/3 of our funding comes from donations to provide us the freedom to run the organization.

- Request for support in newsletter.
- Reminder that we can accept livestock donations.
- Letters will mailed to donors
- Request made online and in e-mail
- Online donations accepted

- Brainerd Foundation has agreed to support BHWC for \$85,000 over 2 years to support capacity. The funding will support training and infrastructure support of the organization including support of staff. Goal is to decrease dependency on projects in order to free staff time up to strengthen the organization. This will create long-term sustainability and end the roller coaster effect. This funding is an outstanding opportunity to the organization; however, it does not come without strings. We will be held accountable and watched to be sure we are aggressively achieving this goal.

*Steering Committee -*

- As part of the Brainerd Foundation support, the SC recommends hiring a coordinator position. The position should be part time and filled by a highly qualified person who can manage projects and represent the committee. Discussion included the cautious move forward to increase our capacity without overstepping our ability to support the position. --- No opposition voiced. BHWC will seek a new position.

- As part of the Brainerd Foundation, the SC and Jen recommend the February annual meeting to be a closed partial or full day meeting for the board to take an in-depth look at the organization, budget, fundraising and

long-term planning. The goal would be to strengthen the board and ensure all 22 members are in agreement and understanding for the direction of the organization. -- No opposition. BHWC will plan this event.

*Wildlife Committee – Jim Hagenbarth*

- Range Rider program will be reviewed Dec 11, 2013 to determine future
- Bison EA is out for comment for bison outside of Yellowstone National Park
- Sage Grouse: A meeting was held recently with the Governors Advisory Council. A plan needs to be developed that will go the courts. The plan will describe actions to stop the decline of the Sage Grouse.
- Elk Brucellosis report came out today from Neil Anderson
- Grizzly Bear delisting proposal is coming up
- Wolf Legislation passed: Jim reiterated the need to maintain money to monitor collared wolves and to keep wolf numbers within the guidelines.
- The carcass removal program has gained energy. A meeting was held recently in Dillon. Four sites in Beaverhead and Madison counties have been identified as compost sites. Carcasses would be transported by truck from roadsides and ranches in Beaverhead and Madison counties.

*Discussion:* Would you consider using this program? -- Yes

*Weed Committee, Mark Kambich*

- The volunteer spray days went well this year. Some spots need additional work. Mark will be talking with landowners over the winter to treat these areas.
- WWB 2013 grossed near \$23,000 with expenses near \$9000.
- Additional cost-share money is available
- River spray funding has been reduced. Weed committee proposes supporting this program with \$5,0000.
- BHWC April meeting will include river applicators
- Ray Tilman passed away this year. His wife and grandsons plan to continue the weed spray business.
- Weed committee considering partners with SW MT Weed Control Assoc for a weed education trailer.

*Land Use Planning Committee - Jen Boyer/ Jen Downing*

- MT DNRC hope to complete state adoption of the floodplain maps early in 2014 after falling behind schedule due to changes in personnel. Once state adoption is final, they maps would immediately be available for county adoption.

**Presentation: Lower Wise River Water Resources Investigation, by Jennifer Downing, BHWC. Ginette Abdo and Todd Myse of Montana Bureau of Mines and Geology, and Jim Olsen, Montana Fish, Wildlife and Parks. *See Presentation Attached***

**Abstract:**

The Lower Wise River Water Resources Investigation inventoried baseline conditions of surface water, groundwater, surface water/groundwater interactions, water temperature, and fisheries. The Wise River is the largest tributary to the Big Hole River and located in southwest Montana. The study begins at the on the Wise River below the confluence of Pattengail Creek and ends at Wise River mouth as it enters the Big Hole River near the Town of Wise River. The Big Hole River is considered to have impaired water quality due to high water temperatures and a number of other issues related to physical habitat. The Wise River is also considered to have impaired water quality, primarily due to high sediment/siltation, metals, and physical habitat alterations. Wise River is a documented important cold water influx for the Big Hole River through surface waters and its many springs. Several irrigation infrastructures are present on the Wise River in each requiring in-stream management, and are without flow measurement. Changes in irrigation infrastructure have occurred in recently.

The following parameters were collected for this investigation: surface flows using TruTrack loggers and synoptic sampling, groundwater levels using a groundwater well network, water quality parameters for ground- and surface waters (pH, specific conductivity, and temperature), and isotope analyses (oxygen -18 and

deuterium). Major findings from this investigation are below. Additional findings are provided in the discussion section:

#### Groundwater:

- Overall the 14 groundwater hydrographs showed similar patterns, where elevations peak near July with spring runoff and the start of irrigation, decline through the rest of the summer, increase for a short period with the onset of fall irrigation, then decline again into the late fall/early winter when they reach base level. Any alterations in this pattern were likely due to local effects such as well pumping or withdrawal in proximity, local groundwater recharge, etc. Annual fluctuation was between 7 and 32 feet.

#### Surface Water:

- Surface water in the Wise River peaked with snowmelt. Prior to irrigation, Wise River gains water as it moves downstream from the top of the reach to the mouth. During irrigation, the opposite occurs with the top of the reach having higher flows than the bottom of the reach;
- Water temperatures in the mid reach and lower reaches of the study area peaked in late summer. Water temperatures greater than 70°F occurred and may have caused stress to fish.

#### Groundwater-Surface Water Interaction:

- The isotope data indicate that the sources of groundwater and surface water are the same and that they interchange with one another;
- Groundwater and surface water elevations evaluated near the mouth of Wise River indicate that during the irrigation season groundwater is providing a source of cool flow to Wise River, while during the non-irrigation season Wise River is recharging the groundwater;

#### Fish:

- The fish population in the Wise River in the lower reached downstream of Adson Creek Bridge is likely limited by the number and quality of slow water habitats and low summer stream flows. Low stream flows in the summer due to irrigation withdrawal likely greatly reduce available habitat in the river.

**New Business** - Jim Hagenbarth introduced a potential meeting topic with a company that does forage restoration that can be used in a number of applications, including transitioning from irrigated back to dessert lands. They are interested in providing a short seminar or presentation followed by consultation with individuals on their properties over a two day period. Attendees showed some interest. We will look into this further.

#### **Future Agendas**

- January 15, 6pm: Water Rights -- MFWP and DNRC will discuss Big Hole River Adjudication, Chronic Dewatering Status, Murphy Rights and more.

#### **Adjourn**

**Big Hole River Snowpack Outlook (Mike Roberts, Hydrologist, DNRC) November 20, 2013**

*(Data sources include NRCS and USGS)*

Snowpack and Precipitation

The fall of 2013 started off quickly with Big Hole Basin snowpack well above average (168.3%) based on the 1981-2010 period. The higher elevation stations are doing a better relative job of holding snow as valley temperatures have been slightly warmer than average. Basin precipitation is considerably lower, reporting 81.5% of the water year average for the SNOTEL sites. Following a huge September that dropped over four inches of precipitation in much of the basin, precipitation has tailed off considerably since the start of the water year (October 1). The discrepancy between the snowpack and precipitation values at the SNOTEL sites is likely due to the accumulation of high elevation snow prior to October 1 (the beginning of WY 2014) that counted for WY2014 versus the precipitation accumulation that does not begin until October 1.

<b>2013 BIG HOLE BASIN SNOW WATER EQUIVALENT</b>				
Base Period	1981-2010	20-Nov		
		current	normal	%
	elevation	inches	inches	median
Barker Lakes	8250	6.7	3.1	216
Basin Creek	7180	4.2	1.7	247
Bloody Dick	7600	3	1.9	158
Calvert Creek	6430	0.6	0.6	100
Darkhorse Lake	8600	8.6	5.4	144
Moose Creek	6200	1.8	1.9	95
Mule Creek	8300	4.0	2.8	143
Saddle Mtn.	7940	6.4	3.6	178
<b>TOTAL</b>		<b>35.3</b>	<b>21.0</b>	
<b>BASIN AVERAGE</b>		<b>168.1</b>		
<b>2013 BIG HOLE BASIN APPROXIMATE PRECIPITATION</b>				
Base Period	1981-2010	20-Nov		
		current	normal	% avg
	elevation	inches	inches	
Barker Lakes	8250	3.4	4.2	81
Basin Creek	7180	3.4	2.7	126
Bloody Dick	7600	3.6	3.6	100
Calvert Creek	6430	1.3	2.4	54
Darkhorse Lake	8600	4.6	6.2	74
Moose Creek	6200	3.4	4.0	85
Mule Creek	8300	2.5	3.9	64
Saddle Mtn.	7940	3.4	4.4	77
<b>TOTAL</b>		<b>25.6</b>	<b>31.4</b>	
<b>BASIN AVERAGE</b>		<b>81.5</b>		

Streamflow

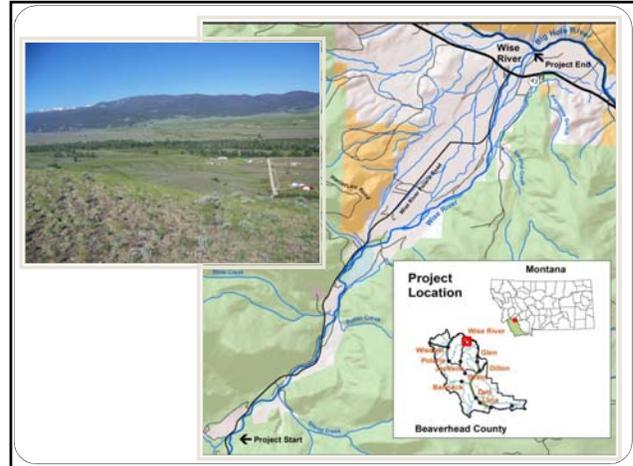
The wet weather in September resulted in above average streamflows for the latter half of September and most of October. With the exception of the year-round station at Melrose (06025500), all USGS gage sites are shut down for the season.

Outlook

There are no strong indications either way regarding long-term (winter-spring) precipitation and temperature at this time. The wet weather present in the early fall and the above average mountain precipitation has provided a good start towards soil moisture recovery and accumulation of the Big Hole Basin snowpack.

## Lower Wise River Water Resources Investigation 2011-2012

November 2013



### Background

- 1927 : Pattengail dam flood channelizes lower Wise River
- 1970's: Lower Wise River subdivided. Future development does not require subdivision review.
- 1973-1985: USGS Stream Gage operates on Wise River near Stine Creek
- 2003: BHWC study assembles history, habitat and water data.
- 2009: TMDL cites Wise River and springs as important coldwater source for Big hole River. Wise River impaired for sediment, metals.
- 2010: Wise River Irrigation Prioritization Study
- 2011-12: Irrigation improvement to reduce points of diversion and river disruption, stockwater tanks.
- 2013: Middle-Lower Big Hole River Watershed Restoration Plan cites Wise River as important restoration area.
- 2013: 90 acres of flood irrigation converted to sprinkler & stockwater



### Lower Wise River Notes

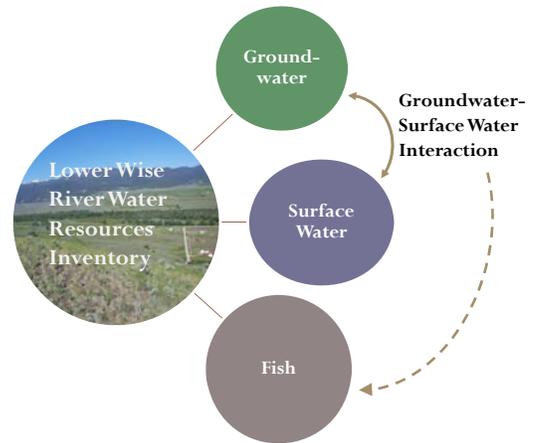
- Irrigation ditches feed groundwater and springs in Wise River and contribute to the coldwater.
- Well water contamination
- Large variations in groundwater levels
- Low stream flows
- Low fish numbers
- Changes in land use, irrigation and development
- Poor fish habitat
- Monitor change over time
- Need educated decision-making

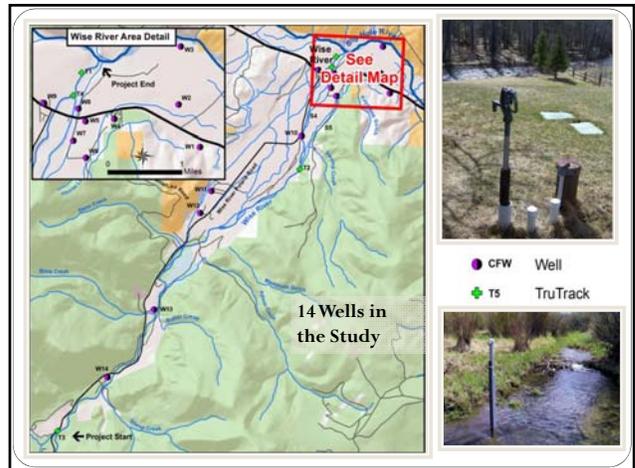
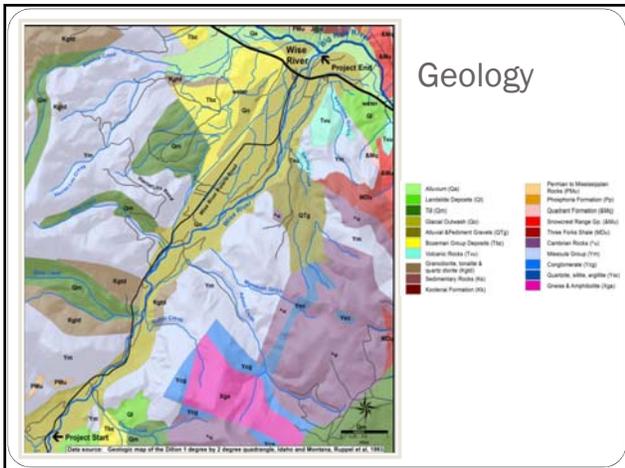
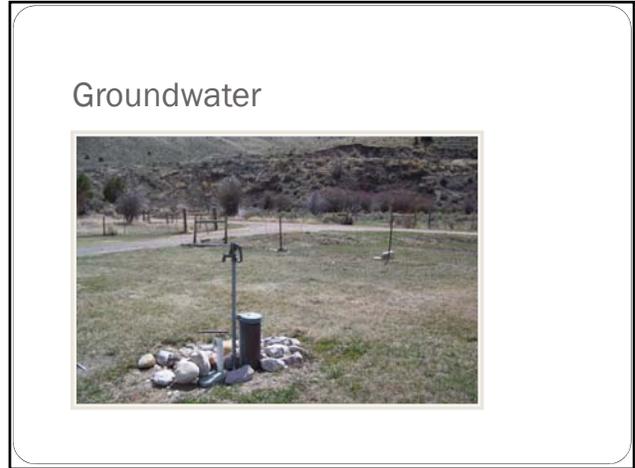
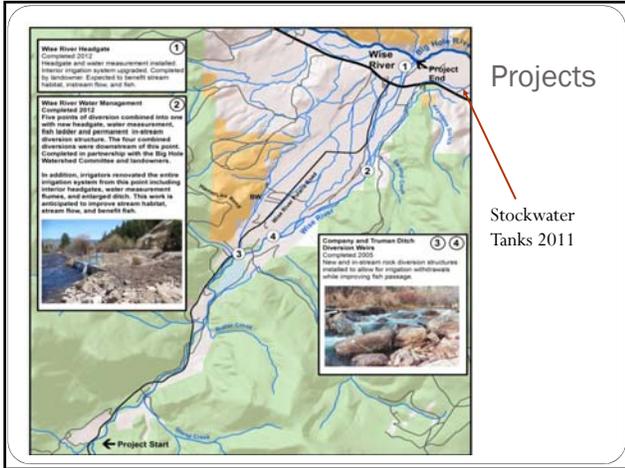


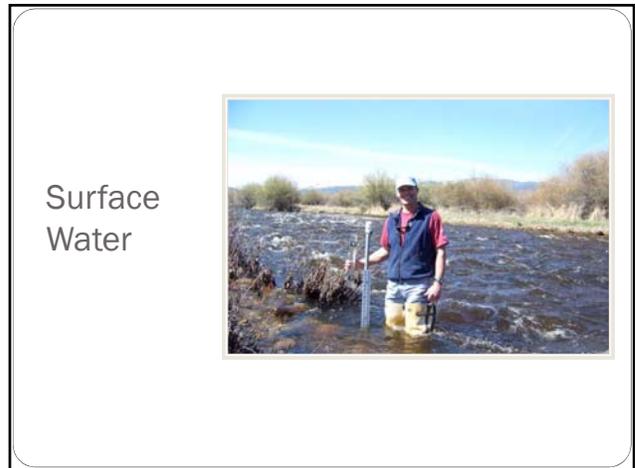
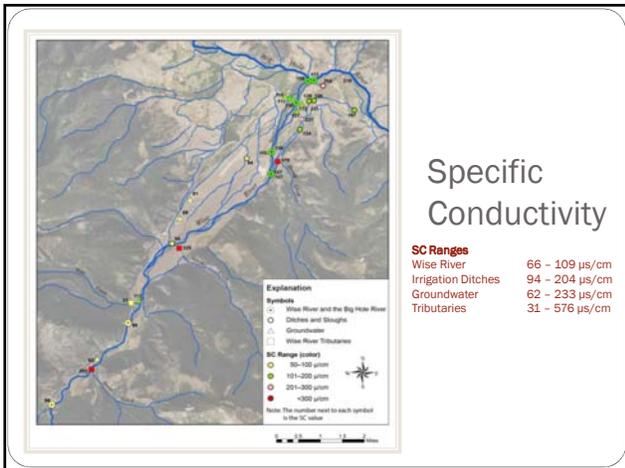
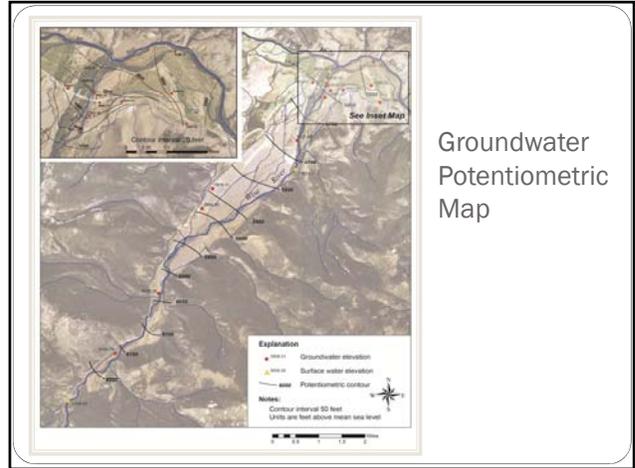
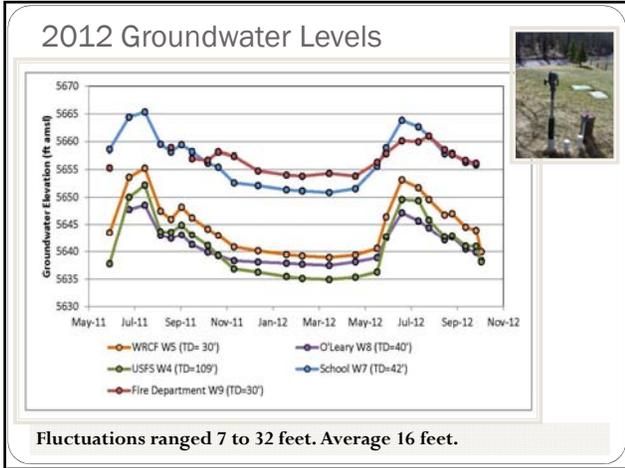
### In the Lower Wise River . . .

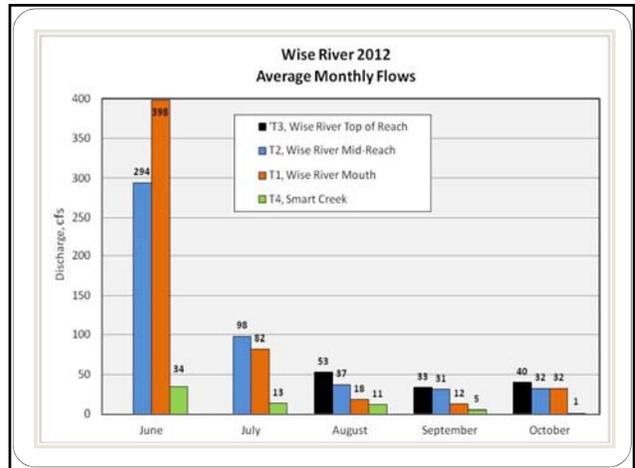
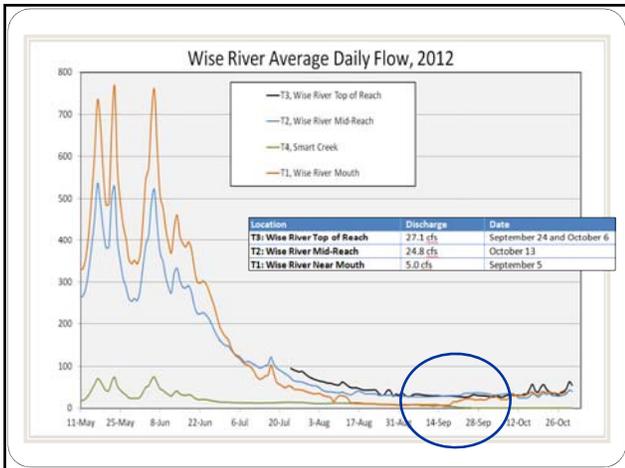
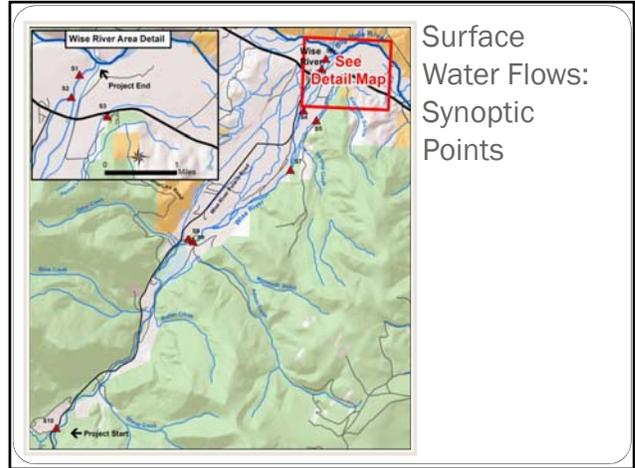
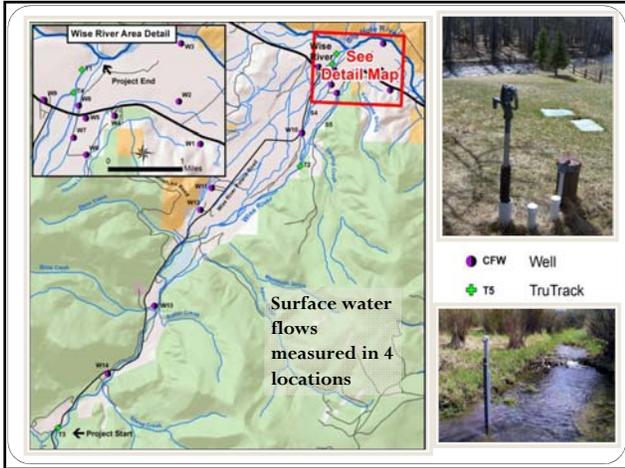


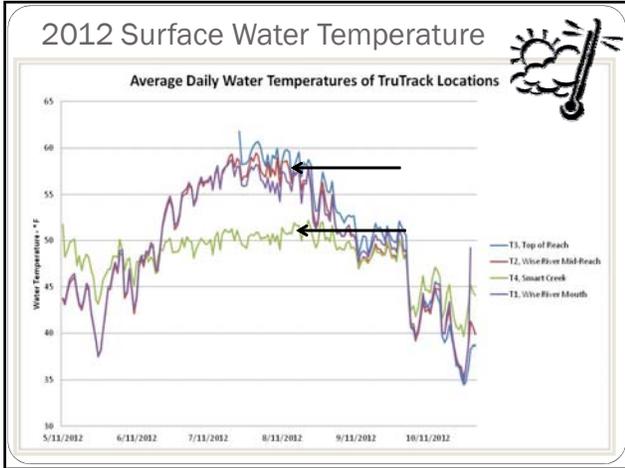
- What is the characterization of the groundwater system?  
*i.e. water quality, direction of flow, sources, map, depth, etc.*
- What is the groundwater/surface water relationship?  
*i.e. Where are the connections? Direction of connections? Seasonal variance?*
- What is the characterization of the surface water system?  
*i.e. how much surface water enters the Big Hole River? How does this change seasonally? How does this change longitudinally from the top of the reach to the bottom? What are the sources of input and outflow?*
- Specific to the irrigation infrastructure project, how do recent projects impact surface water flows and groundwater levels?
- What is the baseline condition of the Wise River fishery?  
*i.e. What species are found in the Wise River? What are the baseline population estimates? What is the existing condition of the fishery? What appears to be the limiting factors, if any, for fish?*
- What recommendations for the future can we suggest with the results of this project to address water quality?  
*i.e. Drought Management Plan, assessment plan for improvements*





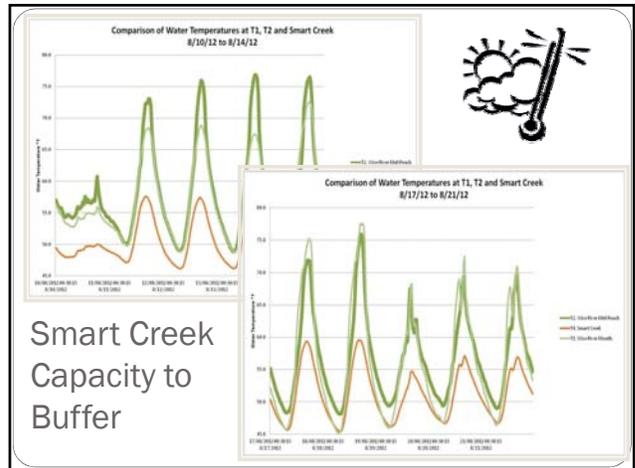
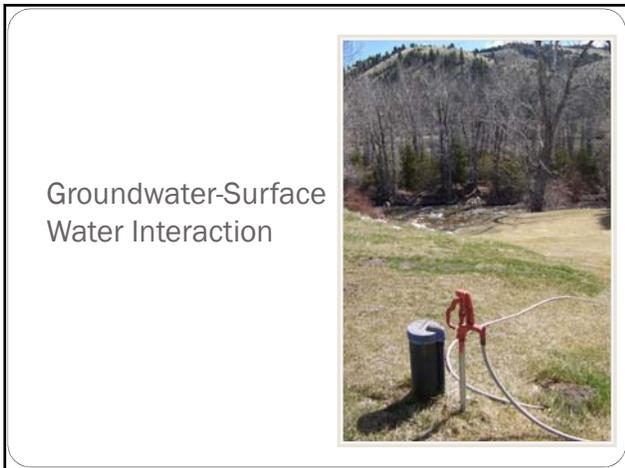




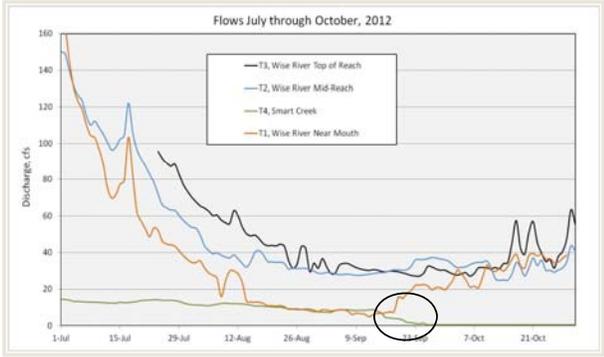


### 2012 Peak Surface Water Temperatures

Water Temperature Summary Data	T3 Wise River Top of Reach	T2 Wise River Mid-Reach	T4 Smart Creek	T1 Wise River Mouth
<b>Average Water Temperature</b>	50.7°F (7/24 - 10/31/12)	49.7°F	48.0°F	49.9°F
<b>Minimum Temperature</b>	33.6°F	33.5°F	37.5°F	33.2°F
<b>Date</b>	10/26/2012	10/26/12	10/26/12	10/26/12
<b>Maximum Temperature</b>	68.1°F	76.8°F	59.7°F	77.5°F
<b>Date</b>	8/14/12	8/13/12	8/16/12	8/18/12
<b>Number of days over 70°F</b>	0	15 7/31/12 - 8/23/12	0	8 8/14/12 - 8/23/12
<b>Number of days over 73°F</b>	0	7 8/5/12 - 8/22/12	0	4 8/16/12 - 8/22/12
<b>Number of days over 77°F</b>	0	0	0	1 8/18/12



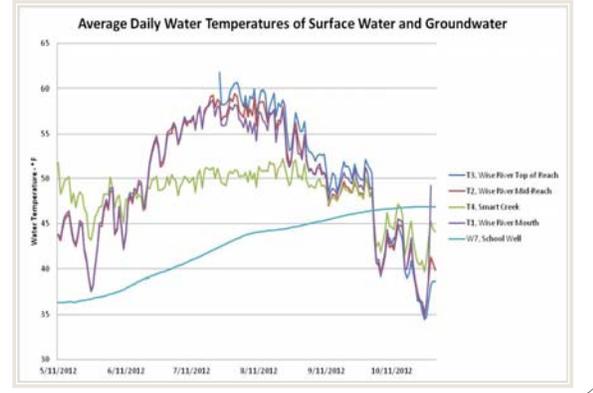
### Late Season Surface Water Flows



### Groundwater-Surface Water Levels 2012



### 2012 Water Temperatures



Wise River Area Detail

Project End

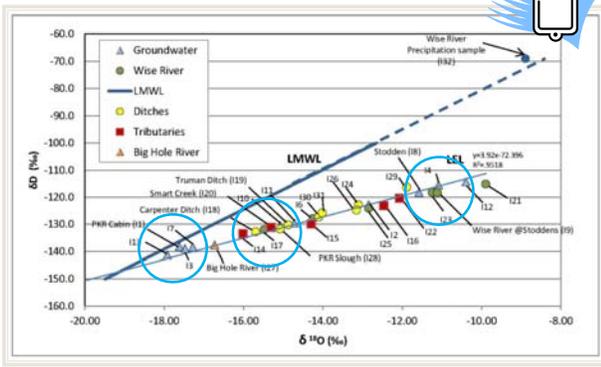
Project Start

See Detail Map

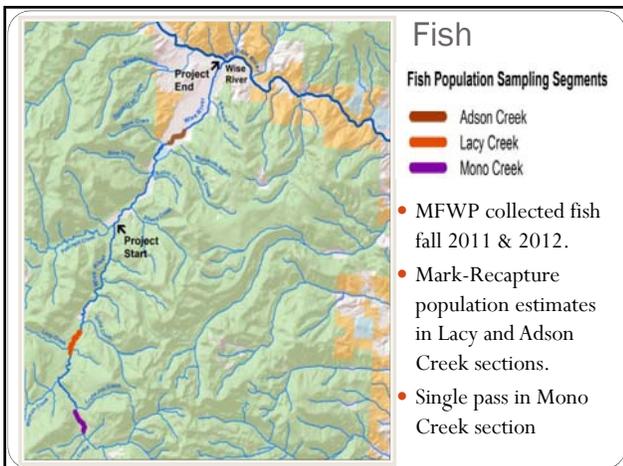
Water Chemistry & Isotopes

32 Locations  
11 Groundwater  
21 Surface Water

### Isotope Results

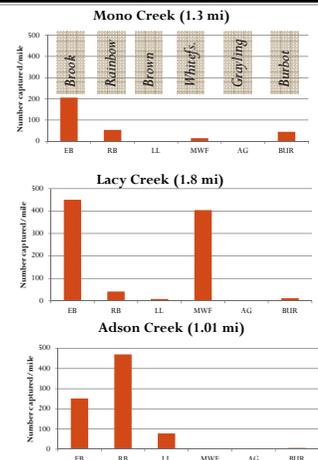


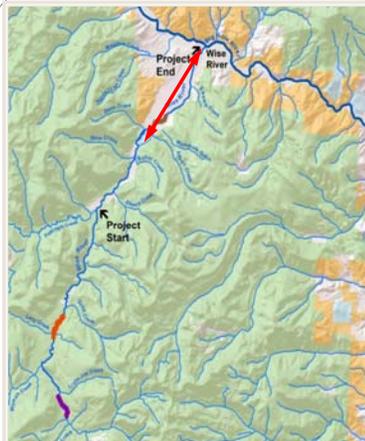
### Fish



### Fish Population Estimates in Wise River 2011 & 2012

**1,669 Trout / mile**  
 861 Rainbow Trout / mile  
 639 Brook Trout / mile  
 169 Brown Trout / mile



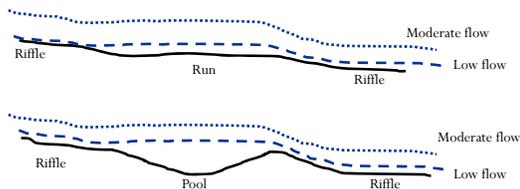


### Habitat

- Habitat survey from Adson Creek bridge to Wise River (5 miles)
- Classified habitat as riffle, run, pool
  - GPS'd habitat features and photo points
- Habitat notes

### Habitat Findings

- >85% of habitat is riffle, 10% run, less than 5% pools
  - 1 significant pool in nearly 5 miles of river
  - Runs common where pools would typically form
    - Pools important for low water and winter habitat



### Habitat Findings

- 85% of habitat is riffle, 10% run less than 5% pools
  - 1 significant pool in nearly 5 miles of river
  - runs common where pools would typically form
    - Benefits of pools for low water and winter
- Habitat more diverse near Adson Creek
  - Larger substrate makes for good micro habitats (pocket water)
    - Fish density and size greatest in this section
- Opportunities for habitat enhancement and pool formation

### Summary



#### Groundwater

- Groundwater elevations peak near July with spring runoff and irrigation, decline through summer, increase again with fall irrigation, then decline through winter to a base level.
- Specific Conductivity is highest on the east side and downstream.

#### Surface Water

- Surface water flow: top > mouth prior to irrigation, top < mouth during irrigation.
- 2012 season far below average for snowpack and flows.
- Water temperatures increase to stressful and lethal levels for fish near the Wise River mouth.
- Top of reach has little gain/loss to groundwater; Middle of reach loses to groundwater; lower reach gains groundwater

## Summary

- Isotope data indicate sources of groundwater and surface water are the same and interchange with one another;
- Mouth of Wise River: During the irrigation groundwater enters Wise River, during the non-irrigation season Wise River is recharging the groundwater;
- Cold groundwater and Smart Creek buffer high water temperatures in Wise River; however, when groundwater becomes depleted and water temperatures are extremely high, it is less able to buffer Wise River water temperatures.



## Summary



### Fish

- Upper Wise River (headwaters to downstream of Lacy Creek) could be an area where Arctic grayling could be introduced.
- Density of brook trout in the Upper Wise River is relatively low.
- Fish population in the Wise River downstream of Adson Creek is likely limited by the number and quality of slow water habitats and low summer stream flows. Low stream flows in the summer due to irrigation withdrawal likely greatly reduce available habitat.

## The Catch . . .

Reported results are based on a short window of time (2011-2012)

Continued long-term monitoring will tease out patterns and track change over time.

## Wish List for More Information



- Reinststate a USGS Real-Time Station on Wise River
- Additional water sampling (cation/anion) to further examine surface water/groundwater interactions
- Measure temperature above and below Wise River on Big Hole River to examine the influence of Wise River cooling.
- Metals sampling on Wise River to determine if metals play a role in reduced fish numbers.
- Add additional groundwater measure points, esp. near surface water points, to better spatially represent valley.
- Long-term monitoring of channel and habitat conditions
- Fish tracking to determine use of Wise River for spawning

## Next Steps



- Continue Monitoring: 4 TruTracks, 1 Groundwater Meter
- Seek development of Wise River Drought Management flow and temperature triggers to join with the Big Hole River Drought Management Plan.
- Seek irrigation improvements as outlined in the 2010 Wise River Irrigation Infrastructure Inventory;
- Seek non-irrigation watershed improvement projects in the entire Wise River watershed that can reduce sediment/siltation, improve fish habitat, and contribute cold waters to the Wise River.
- Wise River as a potential GWIP project under Montana Bureau of Mines and Geology.



Thank  
You